	Application No.	Applicant(s)
Notice of Allowability	09/685,481	JU ET AL.
	Examiner	**Art Unit**	
	Ted T. Vo	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *6/09/04*.

2. ☒ The allowed claim(s) is/are *1-18*.

3. ☐ The drawings filed on _____ are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

      1) ☒ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

    Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☒ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

ANTONY NGUYEN-BA
PRIMARY EXAMINER

1.   This action is in response to the Amendment Under 37 CFR 1.111, filed on 6/9/04.

The arguments in the Remarks section (Pages 8-15) to independent Claims 1, 7, and 13, have

been fully considered. The arguments are persuasive and overcome the rejection in combination under

the closest arts of record, Pettis et al, "Profile Guided Code Positioning" ACM 1990 in view of Tomko et

al, "Profile Driven Weight Decomposition".

Reasons for Allowance

2.   Claims 1-18 are allowed.

Prior art of record, Pettis et al, discloses a flow graph of a program in a compilation process,

where all basis blocks in the flow-graph are partitioned into groups so that the size of each partition is

minimized and thus it balances loading and accounts for cache misses.

However, as pointed out by Applicants that such a partition does not teach restructuring the basic

blocks into contiguous code corresponding to clusters (re: Remarks: page 12, second full paragraph from

the last).

Prior art of record, Tomko et al, "Profile Driven Weight Decomposition", discloses the graph

partitioning included with "node weight" which is not expliciltly disclosed in Pettis et al, where Tomko et

al., discloses a flow graph with vertex weights and edge weights for use with graph partitioning. The

method partitions the vertices (nodes) and edges into the number of disjoint subsets so that the sum of

the vertex weights for the subset with the highest sum is closed to the average sum, and the total cost of

the cut edge is minimized.

However, as pointed out by Applicants that such a partition does not teach partitioning the nodes

of the PEG into clusters such that sum of weights of edges whose endpoints are different cluster are

minimized, and such that for any cluster, a sum of weights of the nodes in the cluster is no loner greater

than an upper bound corresponding to the size of the first level of the memory hierarchy (Re: Remarks:

page 14, lines 1-12).

Therefore, the following is an examiner's statement of reasons for allowance:

The cited prior arts taken alone or in combination fail to teach the claims to a method, an article of

manufacture, and a computer system for restructuring a program comprising basic blocks for execution by

a computer having a memory hierarchy comprised of a plurality levels, and comprising at least features:

"b) for the first level of the memory hierarchy, partitioning the nodes of the PEG into clusters, such

that a sum of weights of the edges whose endpoints are in different clusters is minimized, and such that,

for any cluster, a sum of weights of the nodes in the cluster is no greater than an upper bound

corresponding to a size of the first level of the memory hierarchy;

c) restructuring the basic blocks into contiguous code corresponding to the clusters, such that the

basic blocks that communicate extensively with each other are on a same level of the memory hierarchy,

in order to reduce communications between the basic blocks across the levels of the memory hierarchy."

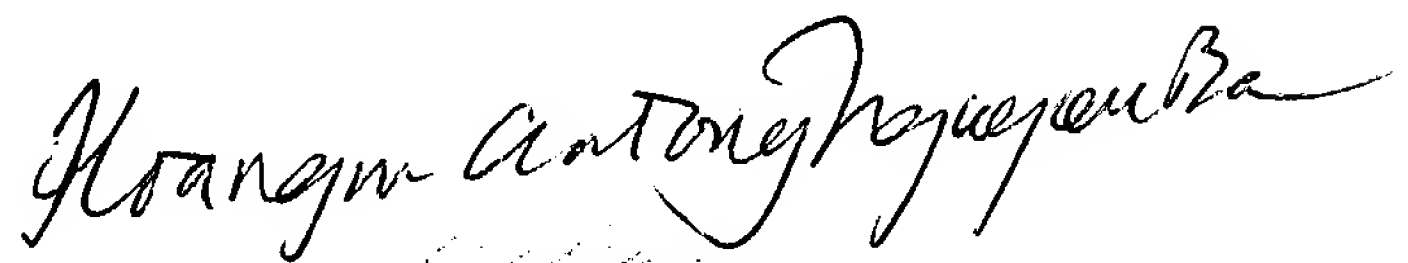as recited in such manners in independent Claims 1, 7, and 13.

3.   Any inquiry concerning this communication or earlier communications from the examiner should

be directed to Ted T. Vo whose telephone number is (703) 308-9049. The examiner can normally be

reached on 8:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan

Q. Dam can be reached on (703) 305-4552. The fax phone number for the organization where this

application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be obtained from

either Private PAIR or Public PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC)

at 866-217-9197 (toll-free).

TTV
Patent Examiner
AU 2122
August 20, 2004

ANTONY NGUYEN-BA
PRIMARY EXAMINER